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## ORIGINAL ARTICLES.

### METASTATIC PANOPHTHALMITIS.\*

By CHARLES J. KIPP, M. D.,

NEWARK, N. J.

Twenty-two years ago I published three cases of metastatic ophthalmia† in each of which the disease was confined to one eye. All of these patients recovered, but with the loss of the eye. In one of these cases puerperal pyaemia was the cause of the eye disease; in the other two a purulent inflammation of the middle ear was the primary disease. Since that time I have not seen a single case of metastatic ophthalmitis in connection with puerperal sepsis, which is doubtless due to the happily increasing rarity of puerperal septic affections. Surgical pyaemia or septic pyaemia is not so rarely met with, but eye disease must rarely occur in connection with it, as I have not seen other cases than those reported, in the various general hospitals with which I am connected and in which the attending surgeons invariably call my attention to cases in which an eye affection is developed while under their care. Although the cases below reported do not present any unusual features, so far as the eye disease is concerned, I believe they are of sufficient interest to the practitioner to warrant their publication.

\*Journal of the Medical Society of New Jersey.

†American Journal of Medical Science, 1884, p. 417.

Case 1. Appendicitis; Phlegmasia alba dolens; Metastatic Panophthalmitis both eyes.

This case was under the care of Dr. Edward Staehlin, to whom I am indebted for the following history:

A woman, 54 years old, married, well nourished, and healthy except occasional attacks of indigestion of a mild degree, was suddenly taken sick 7 a. m., January 27, 1906, with severe pains of a colicky nature in the lower abdominal region, associated with painful and frequent micturition. These pains were located at the McBurney point. Rectal temp. 101, pulse 80. There was constipation and eructation of gas, no flatus. Renal colic was excluded because of normal condition of urine. Localized tenderness, elevation of temperature, constipation; and appendicitis was diagnosticated because of these symptoms—appendicitis with posterior attachment or involvement, probably in close proximity to ureter.

Operation 5 p. m. on same day, substantiated the diagnosis. The wound was sewed up tight, and a favorable prognosis given. She passed an uneventful week and the dressing was changed; primary union; felt well; ate well, and she was assured she might go home at the end of her second full week. During the night of the eighth day she was sleepless, restless, temperature ran up from 99 4-10 to 102 6-10, pulse 108. Next morning the left leg was very much swollen and painful and by evening a well-marked phlegmasia alba dolens had developed. In nine days her temperature was again normal and remained so until the 10th of March; by this time the limb had become normal in dimensions. She felt well in every way, her digestion was good and we planned for her return home. During the night of the 10th of March the temperature shot up to 104 6-10; she vomited undigested food and had profuse watery stools containing particles of undigested food (12 stools in twenty-four hours). In next twenty-four hours, 4 watery stools. From this time her stools continued loose up to the time of her death, March 29. From March 10 to March 14 her temperature had gradually come down from 104 6-10 to 100, then rose again to 104 and from that time, March 14, to March 29 had fluctuated between 101 and 104. The sudden onset of the diarrhoea and the persistence of the watery character made me think of mesenteric emboli. March 14 she complained of very severe pains in her knees which were very agonizing but intermittent; there was no effusion. Blood examination March 18: normal, no streptococci demonstrated, no leucocytosis.

March 18 she developed eye symptoms, first in right eye, a day later in left, the onset was very rapid. Dr. Kipp saw her at this time. She complained of much impairment of sight. The eyelids became red and swollen. The eyeballs began to protrude. The conjunctiva was œdematous. The cornea hazy, the aqueous humor was turbid. The iris was discolored and mostly covered with a purulent exudation. The pupil was small and filled with exudation. The cornea was insensitive. No ophthalmoscopic examination could be made. The left eye was not much protruded and there was not so much swelling of the ocular conjunctiva, but otherwise it was about in the same condition as the right. On the following day she was totally blind. She did not complain of much pain in the eyes. Warm water compresses were applied and a solution of sulphate of atropine 1 per cent. was instilled every three hours. The treatment had, however, no effect whatever on the eyes, which continued in about the same condition up to the time of her death—eleven days after the beginning of the ophthalmia. No perforation of sclerotic or cornea occurred. From 18th to 29th March she continued in this condition: Bowels loose, sometimes moved involuntarily; abdomen at times markedly distended; occasional nausea and vomiting. Urine—spec. gr. 1020-1015, trace of albumen and a few hyaline casts. Mind clear at times, alternating with mild delirium. No autopsy could be obtained.

Case II. Septico-Pyæmia following lacerated wound of foot and leg; acute ulcerative endocarditis; metastatic panophthalmitis of both eyes. Death 45 days after injury.

M. D., an Italian 15 years of age, was admitted to the City Hospital February 25, 1906. Family history negative. Five days before admission his left foot was caught between elevator and platform; foot was badly crushed and bled profusely. The physician who first saw him sutured wound with catgut. On admission his general condition was fair, the heartbeat rapid and strong. No dullness of lungs, but large and small rales through both lungs; breath sounds roughened. Abdominal organs negative. The left foot was badly crushed, a lacerated wound about two inches in length on inner side of foot which had been tightly closed by catgut sutures some days before by a surgeon outside of the hospital; foot and leg up to knee were swollen and discolored. Temperature 103.4-10, pulse 130, respiration 24. The sutures were removed and incisions made in foot and leg, wet dressing of bisulphite of sodium was applied and the limb put in a right angle splint.

The treatment failed to prevent the spread of the inflammation upwards and it was thought best to make further multiple incisions higher up on March 3. Brewer's yeast was substituted for the bisulphite of sodium dressing, but as it was apparently without effect the former dressing was again applied. By March 20 the disease had extended up to the left buttock and four days later it had spread to the right buttock. He was put under ether and extensive and deep incisions were made in the parts affected, which evacuated large quantities of pus. During this period the patient had been rapidly losing weight and strength. Symptoms of endocarditis were first observed on or about March 24—about thirty-two days after the receipt of the injury. The left eye first showed signs of inflammation on April 7. There was not much injection of the ocular conjunctiva and no swelling of the lids. The cornea was decidedly hazy, the anterior chamber of normal dimensions, the aqueous humor was turbid and the iris was covered with a thick layer of yellowish white exudation, the pupil was small and filled with the same exudation. No ophthalmoscopic examination could be made. The eyes did not seem to give him any pain, but patient was so apathetic at this time that no answer to questions were given. On the following day a very similar condition was found in the right eye. He was totally blind. There was no great change in the appearance of the eyes during the following days. He died four days after the eye affection was first noticed.

An examination of his urine made February 27 showed a trace of albumen, no casts, no sugar. On March 25 the urine was of specific gr. 1010 and contained a large amount of albumen, and granular casts, but no sugar. An examination of his blood made April 9, two days before his death, showed streptococci in cultures. The secretion from his leg also contained streptococci. The temperature rose to 105 3-10 on the day after his admission and during the following week it ranged from 99 to 104; during the next week it fluctuated between 99 3-10 and 104 4-10. During the remainder of his life about the same fluctuations as previously noticed continued. His pulse beats up to a week before his death ranged from 90 to 144, after that time over 160 and four days before his death it was so weak that it could scarcely be felt. The medical treatment consisted of digitalin gr. 1-100, strychnin sulph. gr. 1-40 every three hours. Morphine was given occasionally for the relief of pain. He was fed on milk and eggs and in the last week was given eggnog freely.

Autopsy, April 12, 1906, by Dr. Charles A. Tetter: Build slight; musculature small; no deformities; left foot badly discolored and misshapen; open wounds in left thigh and leg with thin yellowish pus exudating. Skin—yellowish in color, dry and hard. Hair—scanty, shiny and dry. Teeth were in fairly good condition. Muscles were small and flabby; rigor mortis was absent except in elbows. Panniculus was very scanty, there was no oedema present; body-heat was absent; hypostasis was well marked over back and shoulders. Head was not examined internally. Both eyes: found cornea cloudy, partially collapsed and pus in anterior chambers. Eyes, both removed.

Thorax: Pericardium was not distended; fat somewhat increased. Heart: Auricles distended, filled with fluid, blood and ante-mortem clots; right ventricle slightly enlarged; valves (tricuspid) normal; left ventricle was enlarged; the walls hypertrophied slightly; the mitral valves showed some areas of calcification and the aortic valves several areas of recent ulceration and small areas of calcareous deposits; the valvular flaps were completely ulcerated through in places. Acute ulcerative endocarditis. Lungs showed fresh pleuritic adhesions, tear easily; chronic passive congestion and oedema; a thin yellowish purulent substance in small bronchi; the lungs containing air throughout.

Abdomen: Peritoneum was moist and shiny; fluid not excessive; no adhesions. Spleen was soft and capsule adherent; anaemic infarct size of a silver quarter in left upper portion; rest of pulp very soft. The kidneys were rather small; fat small in amount; capsules stripped rather easily; cortices slightly atrophic; cloudy swelling and beginning degenerative changes and passive congestion. In pelves small amount of thin watery purulent material, also in pyramids. Beginning pyo-nephrosis. Stomach was distended, containing thin foul smelling material, but there were no pathological changes. Intestines, small and large, negative. Liver was rather large—nutmeg-liver, passive congestion, no infarcts seen, gall bladder—negative.

For the history and the notes of autopsy I am indebted to the House Staff of the City Hospital.



*Microscopic Examination of Left Eye.*

By DR. GEORGE S. DIXON.

When the globe was divided an exudate was found in both the anterior and vitreous chambers, which was partially flocculent in character. The greater portion of the exudate within the vitreous chamber was lost during manipulation, and hence does not show in the preparations. The retina was thrown into folds by contraction of the sclera. The lens was found in the posterior portion of the globe embedded in ice (the eye had been frozen) in such a condition and position as to lead us to believe that the dislocation was due to the globe having been allowed to fall, rather than to any pathological process.

Sections show the corneal epithelium in fairly good condition, and Bowman's membrane well marked, but the cornea propria is moderately and evenly infiltrated with small round cells; pannus not present in any of the sections examined. Descemet's membrane is present, but its epithelial lining has disappeared. The iris angle, spaces of Fontana, and canal of Schlemm are obliterated. The anterior chamber contains pus, and a granular exudate with streptococci in large numbers. The iris is swollen and infiltrated with small round cells. The ciliary body and processes are in the same condition, but to a less degree, and a cyclitic membrane is present. The lens, aside from being shrunken and somewhat distorted, is slightly cataractous in the zonular region. The capsule is intact. A purulent exudate surrounds the ciliary processes, and a layer of the same is in contact with the inner surface of the retina.

The inner layers of the retina are in fairly good condition, and the pigmentary layer appears to be intact, but the bacillary layer and the external limiting membrane have undergone granular degeneration and in some locations seem to be somewhat thickened. The choroid is not thickened to any extent, but is filled with small round cells. The sclera shows isolated colonies of small round cells. The sheath of the nerve is thickened, the nerve appears to have been oedematous, and papillitis present. The intervaginal space and nerve also carry numerous small round cells. The infection was due to streptococcus pyogenes longus, the staining reaction of which is peculiar. The germ stains well with Löffler's blue, but does not stain by Gram, nor with dilute Ziehl. We have concluded that this is probably due to the manner of preparation of the globe.

Diagnosis: General uveitis with hypopyon and interstitial keratitis.

Groenouw, in Graefe & Saemisch (Handbuch d. Gesamten Augenheilkunde, 2 te Auflage, Band XI, p. 504) has collected all cases on record of surgical pyaemia in which the eyes were affected. His cases number sixty, of which twenty-six were injuries and operations. As cases of this kind are quite rare and are usually put on record, he thinks that from the following statistical information, derived from his table, a fairly accurate picture may be constructed. The age of the patients varied from one day to sixty-nine years and was on an average thirty-five years. More than one-half of the patients were between twenty and fifty years; one-fourth were more than fifty years old. Among fifty-two persons were forty-one men (79 per cent.), corresponding to the well-known experience that men are more exposed to traumatic injuries leading to pyaemia. The outbreak of the eye disease occurred between the first and forty-fifth day. The course of the eye affection was in no way influenced by its early or late appearance. In the cases ending fatally the duration of the disease was between twelve and one hundred and fifty-three days. On the average it was thirty-six days. Death occurred between the first day and the fifth month after the beginning of the eye disease, on the average on the twenty-fourth day.

Among fifty-three cases there were sixteen bilateral and thirty-seven unilateral cases of ophthalmia. Of the first seventy-five per cent. died, of the latter only fifty-four per cent. The above shows clearly the malignity of the bilateral cases in surgical pyaemia but not as markedly as in the puerperal form. In the four bilateral cases that survived, the ophthalmia developed in both eyes at the same time and ended in panophthalmitis. The unilateral ophthalmia was found mostly in mild cases, but not by any means without exception, and the bilateral ones in cases of severe pyaemia. Endocarditis is more rarely found in surgical pyaemia than in the puerperal form. But if we compare only the cases with metastatic ophthalmia in both forms of pyaemia the difference is but slight. Of the persons in whom the ophthalmia was the only metastasis twenty-five per cent. died, and of those with metastasis in other organs eighty-four per cent. succumbed.

With regard to the pathology, Groenouw says: "The metastatic ophthalmia is caused by the entrance of septic masses into

the capillaries of the eye and in the bilateral cases it is exclusively or predominantly in the retina, and in the unilateral cases also in the uvea (Axenfeld). The infectious masses must be mostly very minutely divided, which in other parts can pass freely and are caught in the very narrow capillaries of the retina. The rapid loss of vision is not to be regarded as the result of the embolism, but rather as the effect of a rapidly developing inflammation.

"The disposition of the eye for metastasis is explained by the narrowness of the capillaries of the retina. (This is also the reason why the ophthalmia is not rarely the only ascertainable metastasis). Other factors are disturbances in the circulation, perhaps the formation of thrombi in the retina and choroid (Axenfeld). The assertion made by some writers that the metastatic ophthalmia is due not only to micro-organisms, but can also be produced by the action of toxins is as yet unproved. The absence of bacteria in the microscopical preparation is by no means proof that they were absent during life. A negative result of the examination is of no value also in cases in which the disease has lasted three months. The micro-organisms which have been found in the metastatic ophthalmia are the streptococcus, staphylococcus pyogenes, pneumococcus, and a few not clearly defined bacteria."

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#### TWO CASES OF CUT THROUGH CORNEA AND INJURY TO LENS, WITH CUTTING INSTRUMENTS, IN CHILDREN.

By J. H. GROSS, M. D.,  
ST. LOUIS, MO.

A. C., boy, aged 4 years, on April 4, '01, was trying to break a stick of kindling wood, with the hammer end of a hatchet; when the hatchet rebounded from the stick, which did not break, and cut O. S.

His mother at once brought him to St. Louis and to me after a local physician had advised enucleation; this having been refused, he ordered cold applications and prescribed a sol. of atropine sulph.

The condition of the left eye when seen was: cut through cornea almost from one limbus to the other, passing through the center of the cornea. Wound gaping. The lens had either



escaped or had been pushed back into the vitreous. No iris prolapse.

Atropine sulph. 1/120, cocaine mur. 1/20, both aqueous and bichloride 1/5000 solutions were used. Then the eye was bandaged.

Patient was sent to St. Mary's Hospital.

On April 5th Dr. W. A. Shoemaker saw patient with me.

We chloroformed the patient, cleansed the wound, and inserted two silk sutures into the cornea, bringing the cut edges of the cornea into apposition. The sutures were passed through the cornea.

Bichloride sol. 1/5000, atropine sulph. 1/120 (aq.) were used and then a collodion dressing applied. Tablets of Hg. Chlor. Mitis gr. 1/10 every two hours were prescribed. The patient seemed fairly comfortable and the dressing was not disturbed for two days. It was then removed and a sol. of atropine sulph. 1/20 in 1/10000 bichloride sol. was ordered to be used every two hours except when patient was asleep. He was kept in bed about a week.

The patient was a spoilt, self-willed boy and the sol. had to be dropped in by the use of force each time. The presence of the mother, too, was rather disadvantageous at such times.

On April 17th (12 days after the sutures had been inserted) it was thought best to remove the sutures. The patient was again chloroformed and the sutures removed.

The corneal wound had only partially united. The wound still gaped somewhat. The pupil was moderately dilated (under chloroform).

On May 29th (after 7 weeks) the eye had become quiet; the pupil (if there was one) was hidden by the corneal scar; iris of good color; anterior chamber good; contour of eye good, i. e., no depressions in globe.

The vision (O. S.) was P. L. and possibly motion of hand at one foot.

The use of atropia was stopped; the patient was kept under observation; and mild antiseptic and astringent solutions were used.

In September there was no photophobia and all treatment was stopped.

The patient was told to report in two months; however, he did not return until almost one year later (1902). Patient did not live in city.

The vision of the eye had now dropped to a doubtful P. L. and the tension had risen to plus 0.5. Dr. Shoemaker also saw the patient at this time.

Pilocarpine 1/960 was prescribed to be used every other day.

He was told to report in six months; again he did not report until one year later (1903).

The tension had now risen to plus 0.75. There still remained slight perception of light.

O. S. is now painful; tension plus 2. Ant. chamber very shallow. Stretching of sclera at corneal limbus. V=No P. L. Some photophobia, and considerable lacrimation.

Ag. 1/480 and pilocarpine 1/240 were used daily and this treatment seemed of some benefit; but the photophobia did not disappear; and since there was now no perception of light; the eye painful; and because of the stretching of the sclera unsightly, enucleation was advised.

Patient was again sent to St. Mary's Hospital and the eye (O. S.) enucleated.

About a week later the photophobia and excessive lacrimation had disappeared.

M., girl, 3½ years. On January 20, '06 (at 7:45 p. m.); while an elder sister was trying to take away a pair of scissors which were about eight inches in length, the patient jerked them toward herself and in so doing cut the right cornea from the upper nasal to the lower temporal quadrant.

The iris was also cut above and below; no prolapse of iris. Three cut ends of the iris are free, the fourth may possibly be caught in the wound.

This was the condition about one hour after the injury.

Atropia 1/120 and cocaine mur. 1/20, both aqueous, and bi-chloride 1/5000 were used, after which the pupil had dilated moderately. A collodion dressing was applied and tablets of the mild chloride of mercury 1/10 gr. each were prescribed, to be taken, three times a day.

The second treatment was accomplished by means of a good deal of coaxing; but the subsequent treatments could only be carried out by force.

So that I was unable to determine the size of the pupil for four days; when it was found to be moderately dilated.

This patient was also a spoilt child whose mother herself possessed but little self control.

The wound was so large that I feared the least pressure on

the globe might result in an evacuation of the contents of the eye.

I saw the patient twice daily and put in as much atropine as I could. At first an aqueous solution, later on the solution of atropine and cocaine in oil.

On January 24th there were well marked lens changes. Pupil moderately dilated. No pain. Patient eats and sleeps well.

Bichloride sol. 1/5000 and atropine 1/120 were used freely, daily, and a collodion dressing applied.

Somewhat later the swelling lens caused an increased tension, but this again soon subsided. Record somewhat defective, but usual treatment given.

February 28th, a dense membrane has formed in pupil. The pupil does not dilate with sol. atropine 1/120 et cocaine 1/30 in oil.

Iris of good color; tension not increased.

About one month later the tension had become minus 0.5.

Vision as nearly as could be determined was doubtful perception of light.

The first case eventually resulted in enucleation; the second may still require it.

In my mind arose the question: Would it not have been better to have enucleated at once?

However, let me read what Prof. Kuhnt suggests.

Prof. Herman Kuhnt of Königsberg in the April number (1906) of the *Zeitschrift für Augenheilkunde*, in an article entitled, "Zur Behandlung frischer, komplizierter, penetrierender Verletzungen der Hornhaut—" "A contribution to the treatment of recent complicated, penetrating wounds of the cornea," gives what I believe is a very valuable suggestion in the treatment of these cases.

Briefly it is this: In all cases of recent complicated, penetrating wounds of the cornea remove a piece of the iris in order ultimately to secure a pupil and to guard against secondary glaucoma.

Kuhnt states that by the term complicated, penetrating wound of the cornea, he means a wound which not only penetrates the cornea, but also wounds the lens, or the ant. uvea and the lens, or possibly also the vitreous.

After some remarks on the management of the corneal wound he continues, "the injurious consequences of the traumatic cataract would be eliminated, in the simplest manner, by its extrac-

tion; however, as everyone knows, this is unfortunately seldom possible. For in an eye so severely injured an *easy* extraction would be permissible; *not*, however, a difficult one or one only to be accomplished with a *spoon* (tracktions r instrumente).

Nevertheless, it seems to me the conditions *demand*; yes, absolutely require—in all cases where we may expect much lenticular swelling from the first, the opening of a safety valve (Sicherheitsventil)—secured by means of an iridectomy.

Many reasons for this proposal may be given.

First. An iridectomy must be made for the subsequent cataract extraction. Hence there is no ground for the argument that it is an unnecessary mutilation.

Second. It is certain that the swelling masses of lens substance will be more readily absorbed if they can pass into the ant. chamber instead of being held back in the post. chamber.

Third. The mechanical pressure on the iris is naturally less; the tendency to grow together to some extent eliminated.

Fourth. The eye can become quiet; the inflammatory hyperaemia can vanish.

Furthermore, the traumatic injury of the cornea will unite sooner and better if the intraocular tension remains low as a result of the iridectomy.

Finally it is of moment to have easy access to the lens, if circumstances which could not be foreseen should make a prompt operation necessary.

These timely reflections which involuntarily forced themselves upon me have also been confirmed by clinical experiences.

Whenever I did *not*, contrary to my better judgment, make the iridectomy, I had later on to regret it.

The irritability, the hyperaemia of the ant. uvea continued much longer and with more severity; *more* developed into obstinate inflammations, and formed more and stronger synechiae than would otherwise have been expected; in consequence, the actual quieting of the eye was attained much later and with it the possibility of removing the obstruction to sight, i. e., the traumatic cataract (Wundstaar).

In looking over the long list of cases in which I performed iridectomy at once, I can not remember a case in which an injury was noticed.

Iridectomy is indicated only in recent traumas in which the inflammatory irritation, or that of the swelling lens has not softened the tissues."

As suitable ones he enumerates a deliberation:

As suitable ones he enumerates:

1. Those cases of extensive penetrating wounds of the cornea and lens in which the lens substance shows an inclination to *swell considerably*.

2. Larger penetrating wounds of the cornea, iris, lens, and finally also of the vitreous, whether there is a probability of considerable swelling of the lens or not, if the wound is central or nearly so.

3. All penetrating wounds of the cornea, lens, iris, and finally of the vitreous in which a rapid closure of the corneal wound by first intention is probably not to be expected.

Kuhnt no longer advises the use of the corneal suture as he did in an article in the *Zeitschrift* of 1901.

However, he uses flaps of the conjunctiva to cover the corneal wound.

In fifty-three cases of fresh complicated penetrating wounds of the cornea, treated by this author, enucleation became necessary in nine cases, because a deep infection had taken place, which resulted in a chronic cyclitis.

In four cases the method and treatment were experimental, in that the author did not *expect* to succeed.

The results in the remaining forty cases were favorable; some of them were surprisingly favorable.

He concludes by saying that he does not doubt that the favorable results in these fifty-three cases were due to the iridectomy, over the corneal wound.

Therefore, he recommends this method to his colleagues for further trial and verification.

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#### PAMPHLETS RECEIVED.

The Blood Clot Dressing. By F. L. Jack, M. D.

The Department of Experimental Medicine. Parke, Davis & Co.

Glaucoma of the Retina. Reports of four cases. By C. S. Ayres, M. D.

Subconjunctival Injections in Diseases of the Eye. By R. S. Lamb, M. D.

Report of Four Cases Showing the Result of Killian's Operation. By F. L. Jack, M. D.



## STUDIES CONCERNING THE ARTERIAL TENSION IN CATARACTOUS INDIVIDUALS.\*

By Drs. H. FRENKEL AND E. GARIPUY.

Translated by Adolf Alt, M. D.

The study of the pathogenesis of senile cataract has inspired numerous hypotheses, with only those of which we shall concern ourselves, which attribute a preponderating influence to the bloodvessels. It seems that there is a tendency in literature to look upon arterio-sclerosis as one of the principal factors in senile cataract.

Thus Deeren (1) thinks that a senile cataract "is only a progressive atheromatous degeneration in individuals predisposed by heredity." He assumes that this degeneration produces a sclerosis of the lens, which if not remaining stationary leads to the senile cataract.

Panas (2) believes, too, that sclerosis of the optico-vitreous vessels could be the natural cause of senile cataract.

De Wecker (3) is more certain; he says: "No doubt, the majority of cataracts occurs in individuals with arthritic arterio-sclerosis."

After these hypothetical opinions we will mention those which are based on anatomical or clinical observations.

Michel (4) states that among fifty-three cases observed, in the unilateral form or when one side was farther developed than the other, there was found an atheromatous lesion of the carotid artery on the same side or more developed on the side corresponding to the farther advanced cataract. His pupils have continued these researches. Yet, the process of research lacks in precision. Thus Nickelsburg (5) examined in the living whether the carotid was harder than normal and came to the same conclusions. But this is a summary clinical examination and bears an essentially subjective character.

On the other hand, other observers having taken up the same researches have not reached the same results as Michel has. Weil (6) finds atheroma of the carotids rarely in cataractous individuals and this atheroma, where it exists, predominates only in two-thirds of the cases on the side of the cataract.

Deutschmann (7) assumes a connection between albuminuria and cataract. This has been contested by a number of observers.

\*Archives d'Ophthalmologie, Oct., 1906.

Becker (8) found albuminuria in only 6% of the cataractous patients. Ewetzky (9) in 10, 5%; Roehmer (10) in his report on ocular arterio-sclerosis before the Congress at Paris in 1906, stated that "almost everybody consents that the cataract is a retrogressive change, a disturbance of the crystalline nutrition;" he collected the principal opinions on this subject but gave no opinion of his own.

More perfected clinical methods have served one of us (11) in studying the kidneys in senile cataract. He found in the urine of cataractous patients:

1. Quantitative changes in the mineral elements; diminution of urea and increase of chlorides.
2. Changes in the permeability of the kidneys; the elimination of methylene blue is much slower and often much retarded.
3. Diminution of the toxic qualities of the urine.

Grille (12) has made use of the cryoscopy of the urine and has found that in the cataractous the osmotic tension of the urine is weak and much inferior to the normal. He concludes that "these individuals have senile kidneys."

Ducasse (13), under the direction of one of us, has again taken up the cryoscopic researches at the laboratory of the ophthalmological clinic of the University of Toulouse, and has reached the same results, not only as regards the reduction of the cryoscopic point, but also of the total molecular value of the separate molecules.

From these cryoscopic alterations he concluded that there was a lessened renal permeability with retention of the toxic products, the presence of which may explain the opacification of the lens.

From all of these clinical researches we may deduce that in the cataractous a special condition exists in the kidney which manifests itself by a reduction in elimination.

Is there a link connecting this renal condition with the opacification of the lens? We might think of arterio-sclerosis, since we have just seen how certain authors have considered this affection to be an important factor in senile cataract.

Yet, it must be stated that we see but rarely ocular manifestations of arterio-sclerosis in the cataractous. Roehmer does not consider an arcus senilis as a sign of arterio-sclerosis. Further, we do not find frequently in the cataractous subconjunctival or retinal haemorrhages, nor embolism or thrombosis of the retinal or cerebral vessels which are, also, signs of arterio-sclerosis.

Michel's statements concerning the atheromatosis of the carotids have not been confirmed.

Thus far then, it has been purely on hypothetical grounds that arterio-sclerosis was given such an important role. It is time that we bring forth precise ideas and then examine by means of sure clinical facts whether the cataractous are subjects of arterio-sclerosis or not.

The arterial tension gives us a precise idea as to the degree of sclerosis of the bloodvessels. Potain & Huchard have shown that arterio-sclerosis is always accompanied by arterial hypertension.

Potain (14) says that the arterio-sclerosis precedes the arterial hypertension and states that "arterial hypertension is found to a certain degree in all forms of arterio-sclerosis."

Huchard (15) says that "permanent arterial hypertension is the cause of the arterio-sclerosis; for a varying period it precedes the evolution of different affections (cardiopathies, interstitial nephritis, etc.), when themselves depend on vascular sclerosis."

Whatever is the initial factor, it is the opinion of these two authors that arterio-sclerosis is always accompanied by arterial hypertension. These results have to this date not been invalidated and the works of Rotermund (16), a pupil of Romberg, cannot be adduced as opposing them, since he concerns himself only with the capillary tension. He finds that, unless there is a renal lesion, the capillary tension is not increased in arterio-sclerosis.

#### *Personal Researches.*

From the foregoing we may consider a study of the permanent arterial tension as the practical and precise means of detecting arterio-sclerosis.

We have made such a study of 108 individuals with different forms of cataract: 99 were senile, 3 complicated, 3 diabetic and 3 with albuminuria. The results of these researches form the subject of this paper.

We have used Laulanie's apparatus which is similar to the one of Riva-Rocci. It consists of a metallic bracelet worked by a screw and carrying in its interior a rubber pelote filled with water in order to transmit the arterial pressure. By means of a rubber tube filled with water this reservoir is connected with a mercurial manometer by means of which the oscillations of

the intravascular tension corresponding to any degree of compression may be read off or, if necessary, registered on a drum carrying blackened paper. The compression is exerted on all of the vessels of the anterior aspect of the forearm. The advantage offered by this arrangement is that we can obtain curves which can be easily controlled at any moment. We apply the apparatus to the forearm 4 or 5 cm. below the elbow joint. The pressures given in the following have always been obtained in the morning before the 11 o'clock lunch. Most of the patients were in the hospital. With outside patients we took the measurements only after they had rested for at least an hour. The individuals were all placed in the same sitting position, the arm resting on a table; chairs and tables were of a uniform shape. All these precautions were taken in order to place the subjects always under the same conditions for examination. With rare exception we have taken several measurements with intervals of a few days, so as to establish the medium permanent tension of the individual.

In plain figures the normal pressure never exceeds 130 mllm. of mercury. Yet, even in the normal, a higher pressure may be found to exist for a time.

As regards the normal pressures found with Laulanie's apparatus we refer to the figures published by one of us (17) and concerning the tensions found in arterio-sclerotic patients to the figures published by Méo (18). In the same work by Méo have been published the complete observations and tensions of some of the cases which we shall report here in order to give the results as a whole. \* \* \*

#### *Analysis of 108 Cases of Cataract.*

In analysing the results obtained we shall only consider the medium tension (expressed in millimeters of mercury) in order to simplify the proceeding. We have divided the medium tensions into—

1. Very feeble tensions, those below 101 mllm. of mercury.
2. Feeble tensions, from 101 to 120 mllm.
3. Normal tensions, from 121 to 140 mllm.
4. High tensions, from 141 to 160 mllm.
5. Very high tensions, from above 160 mllm.

These divisions are somewhat arbitrary. In fact, the figures obtained are not of mathematical precision; for instance, an in-

dividual who has in one series of examinations as medium a high tension, may in another series of examinations have a normal tension. The same may be the case with an individual who has a medium tension of about 140 mllm. While, however, such an observation may be exact in an isolated case, it is nevertheless true that in a great number of cases these differences disappear. This has induced us not to publish this paper until we had a sufficiently large number of observations for giving generalizing results.

Comparing the figures found in the two series, we find that sex does not sensibly influence the arterial tension. Thus we find men of from 60 to 70 years of age to have a medium tension of 130 mllm. For women of the same age it is 126 mllm. We shall, therefore, in the following analysis make no difference between the sexes.

We also, find that age does not influence arterial tension. Among the 80 year old cataractous we have found two very high tensions (160 and 161 mllm.), five normal ones, and one very feeble one. The same figures are found in the different parts of life. These conclusions agree with the results of the researches of Moutier (19).

#### *A. Complicated Cataracts.*

When considering the cataracts complicated with lesions of the membranes of the eye, or glycosuria, or albuminuria, we find that of the nine cases of this kind two had a feeble tension (albuminuria and malignant myopia); two had normal tension, but almost high (atrophy of the optic nerve, 135 mllm.) diabetes, 139 mllm.); five had very high tension (retinitis 194 mllm., two albuminurics 151 and 153 mllm., two diabetics, 177 and 237 mllm.).

In analysing these observations of complicated cataracts we find that feeble normal tensions are seen in patients with a local affection which does not influence the general system or is not the result of a systemic disease (myopia and simple optic atrophy). In this same category we find, also, one non-Brightic albuminuric and one diabetic patient, the latter had been under a strict management for several months.

The very high tensions are found chiefly in the cases in which the eye complications are part of a systemic disease. It is well known that diabetes and especially the affections of the kidneys



elevate the arterial tension. As regards the case of retinitis we can neither find exactly what is its origin nor its nature; but the observation is worthy of a more detailed report.

B. Pierette, 65 years old has an adherent central leucoma on his right cornea due to a traumatic ulcer. Vision in this eye is nil.

In the left eye there is a hypermature cataract which has been there for several years. Yet the visual acuity of this eye is very feeble. He sees light, but not the movements of the hand. He does not see candle light further than 1 meter. With this knowledge and a full statement to him he was operated on. Nothing particular happened during the operation, except that the very soft lens was extracted in its capsule without loss of vitreous. On the eighth day after the operation the pupil was very black, no cortex, almost no inflammatory reaction, the eye in very good condition. Yet the visual acuity was very poor; he counted fingers barely at 15 ctm.; glasses did not improve this. Retinitis. The arterial tension ranged from 190 to 198 mllm.

#### *B. Uncomplicated Cataracts.*

When referring to the properly so-called senile cataract which is not due to any lesion of the deeper membranes of the eye, nor to a general disease, among the 99 individuals we examined: 5 had very feeble tensions (100 mllm. and below); feeble tensions (101 to 12 mllm.); 45 normal tensions (121 to 140 mllm.); 10 high tensions (141 to 160 mllm.) and 9 very high tensions (above 160 mllm.).

Out of these individuals, most of whom have been operated on, we find (1) among the feeble tensions one with atrophic choroiditis in both eyes, and (2) among the normal tensions one who also, had atrophic choroidal spots which reduced his vision materially and one with a secondary cataract had a spontaneous anterior haemorrhage on the fifth day.

(Here follows the history of the last case):

(3) Among the cataracts with a high tension, there is only one peculiar case. G. Rosa., 60 years old, who has come periodically for five years for examination on account of slowly ripening cataracts has still R. V. with — 5 D. = 1-3, and L. V. with — 4 D. = 1-16. The medium arterial pressure is 142 mllm. All other patients have been operated on and nothing worthy of mention occurred.

(4) Among the 9 cases with very high tension we note:

(a) A cataract with a tension of 182 mllm., which has not been operated on; we do not know, therefore, what influence this high tension would have on the result of the operation. The tension was measured three times and always found of the same elevation.

(b) Five individuals with tensions varying from 160 to 178 mllm. who were operated on with perfectly good results and without accident.

(c) Three patients whose history is interesting on account of the accidents which followed the operations:

One with a tension of 176 mllm. had a spontaneous haemorrhage in the anterior chamber 19 days after the operation. Another with a tension of 160 mllm. had such a haemorrhage on the fifth day. The third with a tension of 194 mllm. had an expulsive haemorrhage.

Here are their histories:

(1) P. Theophile, carpenter, 70 years old. Had pneumonia of a months' duration when 30.

R. E. Incomplete aequatorial cataracts a year old but progressing more rapidly since the eye was injured three months previously. V. =  $1/20$ . L. E. senile cataract,  $2\frac{1}{2}$  years old, ripe for 6 months.

L. E. Operated on Jan. 17, 1906. Large upper corneal flap. was much cortex. When this cortex finally came out the patient forced out a drop of fluid vitreous by contracting the lids. Iridectomy. The expulsion of the lens was laborious. There

On the second day he had abnormal pains. When the bandage was removed a small fold of iris was seen to be incarcerated. Some cortex in the pupil not interfering with vision.

On the sixth day the incarcerated iris is covered over with conjunctiva; the anterior chamber is filled. Slight iritis. Atropine is now instilled three times a day.

On Febr. 5th, the nineteenth day, a haemorrhage is found in the anterior chamber of the operated eye. The patient stated that the previous evening he had suddenly felt a sharp pain, without having injured the eye, in fact without known cause. The pain lasted for about an hour. Then he slept quietly. Atropine is discontinued. Gradually the blood became absorbed during the following days and on Feb. 19th only a small hyphaema was left and a little fibrine in the pupil. Counts fingers at 30 ctm. July 17th, still some fibrine in the pupil. Vision good, with + 12 D. =  $1/4$ .

On the day before the haemorrhage occurred the medium arterial tension was very high, 187 mllm.

(2) L. Jean Bernard, 81 years old, tailor. When 27 years old he was confined to the bed for two months on account of a febrile disease.

R. E. Ripe senile cataract, began five or six years previously. For two years this eye has been blind.

L. E. Immature peripheral cataract, began one year ago. The papilla is normal, temporal pigmented crescent, V. =  $1/4$ .

The R. E. was operated on on May 10th, 1906. Large upper corneal flap, iridectomy, no accident.

On the third day, May 13th, good conditions, some cortex colored slightly by blood lies in the pupil. Fingers at 30 ctm. On the 6th day, May 16th, at the morning visit the bandage is stained with blood, even on the outside. The nurse said that about 5 o'clock on the previous evening the patient was quietly walking in the hall when suddenly, without previous traumatism, he complained of a severe pain in the operated eye. The pain became quiet without interference in half an hour and then the blood was seen to filter through the bandage. He did not suffer any more and passed a good night. In the morning the hyphaema occupied the lower third of the anterior chamber. The corneal wound was open and thus the blood had been able to flow into the conjunctival sac and out. V. = movements of the hand; cannot count fingers. Sulphate of sodium was given.

On May 25th the blood was absorbed, a thick mass of fibrine lay near the center of the pupil. With + 11 D. V. =  $1/20$ . The medium arterial tension was highest (170 mllm.) the day before the haemorrhage and fell after the purging.

(3) M. Delphine, housekeeper, 75 years old. Was never sick previously.

R. E. Almost ripe cataract about a year old. Movements of hand at 30 ctm. Iris shadow still visible. L. E. Ripe cataract, began about two years ago. Has not seen for a year. Movements of hand at 20 ctm.

R. E. Operated on on April 5th, 1906. Large upper corneal flap. Iridectomy. The anterior lens capsule was tough, the nucleus very large. Some cortex was easily expelled, but the patient made an unfortunate movement and a drop of vitreous escaped. She was led to her bed. Five hours after the operation, as was her habit, she took some beef tea and a mouthful of wine. An hour after this light meal she was taken with

vomiting and then rested quietly all evening. She did not sleep during the night on account of a frontal headache, which she had never experienced before. The following night again headache.

On April 7th, the bandage was found stained with blood, the corneal wound was held widely gaping by a big clot which protruded from it. The anterior chamber was filled with blood.  $V. = 0$ . This expulsive haemorrhage had probably come on during the vomiting a few hours after the operation and was the cause of the headache, as it usually happens.

On April 11th the bandage was again stained with blood. During the following days the haemorrhage continued, but slowly and every second day the bandage was stained by it. On the 25th the haemorrhage ceased, a large clot lay in the corneal wound. April 28th, there had not been any haemorrhage for four days and the patient left the hospital. Her medium arterial tension on April 16th was as high as 217 mllm.

#### *General Considerations.*

(1) *Pathogeny of Cataract.* In the foregoing we have reported on the results of our researches concerning the permanent arterial tension in 108 cataractous individuals examined by us. Our object was to find whether the arterial tension in the cataractous was sufficiently high to consider these patients as arterio-sclerotics.

We have found on the contrary that arterial hypertension is found exceptionally only in cases of senile cataract. In 99 uncomplicated cases we have found 80 unelevated tensions, that is lower than 140 mllm.; 10 high tensions, not more than 150 mllm., and only 9 with a very high arterial tension.

When we compare these tensions with those found by one of us (17) in glaucoma, we see that even most of the tensions which we consider as very high are inferior to those found in glaucoma; they are, also, much lower than the figures which Méo (18) gives for the arterio-sclerotics since in 13 old men with arterio-sclerosis taken at random at the hospital, he found 177 mllm. to be the lowest tension and 231 mllm. the highest.

We can, therefore, say that if it is true that arterio-sclerosis is always accompanied by a certain degree of hypertension, as is proven by the works of Potain and Huchard, a senile cataract is not usually accompanied by arterio-sclerosis.

From the clinical studies of one of us, cited above, it is seen that the kidney of the cataractous does not eliminate the toxic products of the body in a normal manner, although this insufficiency of elimination does not manifest itself by the symptoms usually found in renal insufficiency. This, then, is not a typical renal insufficiency, but a condition intermediary between the normal and an insufficient kidney as clinically considered.

The study of the arterial tensions proves this view. We find as a fact that this renal condition does not appreciably influence the general circulation. While a renal insufficiency always produces vascular hypertension, even of quite a high degree, we find in the cataractous such hypertension but rarely.

We could from these clinical facts argue that a slight degree of renal insufficiency, a degree not noticed by the usual clinical observation, but found in laboratory research, would be sufficient in order to retain in the organism some toxic products among which would be crystalline cytotoxines. Yet, we can here give no further attention to the subject of cytotoxines so well studied by Roemer (20). We only wanted to point out how we should be able to understand the role played by a diminution of the renal filtration in the cataractous.

(2) *Ocular haemorrhage in the cataractous.* The question of arterial tension with cataract is interesting, and not only from a theoretical standpoint. We can, also, draw some practical conclusions from the facts which we have observed. Thus, we have seen what connection seems to exist between arterial hypertension and spontaneous intraocular haemorrhages which follow a cataract operation. We may divide them into haemorrhages of the anterior and of the posterior segment of the eye.

We have observed 4 cases of haemorrhage, 3 in patients with hypertension. In 42 cases with normal tensions, operated upon, we had only one haemorrhage of the anterior segment, while in 10 cases with very high tension, operated upon, we had 3 intraocular haemorrhages, one of which was an expulsive one. Therefore, the role played by arterial hypertension in these haemorrhages seems clear. It is an interesting fact that in the case of expulsive haemorrhage the tension was found to be much higher than in the cases of haemorrhage in the anterior segment.

In all the cases of haemorrhage in the anterior segment an iridectomy had been performed. We cannot admit that the iridectomy was the cause of the haemorrhage. Haemorrhage due to the cutting of the iris appears during the operation or imme-



diately after it; in our observations an iridectomy had been made in almost all operations, the haemorrhages, however, appeared a long time after on the fourth, fifth and nineteenth days, respectively.

From this we may say that arterial hypertension is one of the principal factors in the production of intraocular haemorrhage after cataract extraction. This will not, however, say that hypertension is the only factor. There may be other causes necessary to the production of the haemorrhage; it may be as in cerebral haemorrhage, that the bloodvessel walls must be diseased. Neither must we disregard the slight loss of vitreous.

It is very interesting to find that, thanks to a study of hypertension, we may know the small number of patients who are exposed to the danger of unfortunate post-operative accidents, as A. Terson had always supposed we could.

As we have often found that purgatives sensibly reduce the tension, it may be possible to prevent these accidents by giving purgatives according to the indications of the sphygmomanometer. Thus, by diminishing by therapeutic measures the arterial tension in individuals with hypertension who are to be operated on for cataract, and by maintaining their tension at a normal degree until healing is complete, we may try to avoid the expulsive haemorrhage which is the worst complication of this operation and, also, the haemorrhages of the anterior segment which sometimes reduce a favorable result which we thought assured.

#### *Conclusions.*

(1) Senile cataract is but very rarely accompanied by arterial hypertension. In 99 cases of noncomplicated senile cataract we have found in 9% only.

(2) Arterial hypertension is always found where there is a general affection which by itself causes hypertension (nephritis, diabetes).

(3) Age does not influence the arterial tension.

(4) If it is true that arterio-sclerosis is always accompanied by a certain degree of arterial hypertension (Potain, Huchard), we can affirm that cataract is not as a rule accompanied by arterio-sclerosis and that arterio-sclerosis is no factor in the production of senile cataract.

(5) The diminution in the permeability of the kidney which

is found in the cataractous has no appreciable influence on the general circulation.

(6) We can assume that a diminution of the permeability of the kidney, so slight as not to manifest itself by appreciable clinical symptoms, is sufficient to retain crystalline cytotoxines in the organism.

(7) The arterial hypertension in the cataractous helps to produce postoperative intraocular haemorrhages which are either haemorrhages of the anterior segment, or expulsive ones.

(8) Therefore it is possible to know before the operation for cataract the small number of patients who by their arterial hypertension are exposed to these haemorrhages, and to try to prevent these complications by diminishing their arterial tension by therapeutic means (diet, purgatives, iodine preparations, etc.)

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(16) Rotermund. Ueber den Capillardruck besonders bei Arteriosklerose nebst Bemerkungen ueber den Blutdruck bei Arteriosklerose. Diss. Marburg, 1904 and 5.

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### PAMPHLETS RECEIVED.

Physical Economies. By E. E. Holt, M. D.

Proceedings of the Missouri Pharmacal Association, 1906.

P. Blakiston's Sons & Co. Physician's Visiting List for 1906.

Dionin in Ophthalmic Practice. By J. Hinshelwood, M. D.

Angioma of the Upper Lid. Operation. By J. W. Charles, M. D.

Operations on 1000 Adenoid Operations. By F. B. Sprague, M. D.

Traumatic Laceration of the Inferior Rectus Muscle. By H. Moulton, M. D.

Cholesterin Crystals in the Vitreous With Optic Atrophy. By G. E. Seaman, M. D.

The Blood Clot Method of Wound Repair in Aural Surgery. By F. B. Sprague, M. D.

Clinical Report on the Use of Alypin as a Local Anaesthetic. By W. C. Philipps, M. D.

Some Facts and Figures Relating to the Blood Clot Dressing in Bone Surgery. By H. O. Reik, M. D.

The Cure of Chronic Suppuration of the Middle Ear Without Removal of the Drum or Ossicles or Loss of Hearing. With 10 cases. By Ch. J. Heath, M. D.

## MEDICAL SOCIETIES.

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### OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

PRIESTLY SMITH, F.R.C.S., President, in the Chair.

*Thursday, October 18th, 1906.*

#### POSTERIOR SCLERITIS.

Mr. George Coats read a paper on posterior scleritis and infarction of the posterior ciliary arteries, referring to the first description of this condition by Fuchs in 1902, and to cases probably similar reported by Knapp, Wagemann, and Salzer. Only two such cases had been submitted to pathological examination. In a case of his own the disease was not diagnosed during life, as the eye when first seen was already disorganized by irido-cyclitis.

On dividing the globe, a peculiar round area 10 mm. in diameter was found above the papilla, in the form of a brown island, surrounded by a broad yellow moat or gutter. Within this area, the inner third of the sclera and the whole thickness of the choroid and retina were completely necrotic. There was no inflammatory thickening of the necrotic patch, but a moderate round-cell infiltration of the living tissues. The other changes in the eye were due to irido-cyclitis and secondary glaucoma.

The amount of necrosis was out of all proportion to the inflammation, so that there must have been vascular obstruction. The necrosis was more extensive in the retina than in the choroid, and in the choroid than in the sclera, and this corresponded to the usual wedge shape of the infarction. The affected area would correspond to the distribution of one of the larger posterior ciliary vessels, and these vessels had but scanty anastomosis with each other. The changes in the retina were closely similar to those found in the rabbit after ligature of the ciliary arteries, and in man after optico-ciliary neurotomy. The sur-

rounding chronic inflammation was similar to that found in non-infective infarctions elsewhere, and the chronic irido-cyclitis was probably of the same nature, due to the diffusion of toxins of low virulence into the vitreous. There was some evidence of vascular obstruction in two of the other reported cases.

#### METASTATIC INFECTION IN THE EYE.

Mr. Holmes Spicer read a paper on metastatic inflammatory affections of the eye, narrating four cases:

(1) A young man had a sudden attack of pain in one eye, with obliteration of the central part of the field of vision. He was in good general health except for a large crop of boils on the buttocks from rowing at Cambridge. On examination of the eye three days after the attack of pain a brilliant green mass was seen springing from the center of the disc; it was round, sharply defined, and had no appearance of structure, such as hooklets. Its appearance suggested a parasitic cyst. It continued to grow, and was making the patient very ill. It was lacerated with a needle under ophthalmoscopic guidance, but it only contained some cloudy opaque material like pus. The eye was enucleated.

The swelling was found to be an abscess in the substance of the retina, having in its center a large mass of staphylococci. The patient made a rapid recovery in health.

(2) A young man who had a large boil on the neck, and was suddenly seized with pain in one eye with loss of sight. He had well-marked phlebitis of the retinal arteries in one eye, and slightly in the other. After prolonged treatment one eye got well, and the other became quiet with loss of sight. Two years later it became acutely inflamed and was then enucleated. Although very seriously ill at the time, he recovered promptly after removal of the eye, showing it to be the only part affected.

The third case was also that of a young man who had retinal phlebitis, followed by local keratitis profunda, after a serious attack of diarrhoea and ptomaine poisoning.

(4) This was one of diffuse exudation on the surface of the choroid, invading slowly nearly the whole of it, and producing in places detachment of the retina. This also occurred in a young man suffering from a large crop of boils on the neck. Treatment by antistaphylococcal injections was commenced, but he refused to continue it.



HUE PERCEPTION.

Dr. Edridge-Green read a paper on hue perception based on observations made with an instrument whereby the exact size of a portion of the spectrum which appeared monochromatic was ascertained, and was then isolated from the adjacent portions. Hue perception was found to be most accurate in the blue and yellow regions, though in most it was more accurate in the yellow region. Then there was a gradual diminution towards the center and ends of the spectrum. Green came next, then violet, and lastly red. These facts were in accordance with his theory of color perception, and were predicted by it, namely, that the color perception of different individuals varied with the development of a color-perceiving center in the brain, that those with a greater development of this center could see more colors (points of difference) than those with a less development, and that colors appeared in a regular order at the successive points of difference in a straight series.

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PAMPHLETS RECEIVED.

Ear Affections and Mental Disturbances. By E. Amberg, M. D.

Squibbs' *Materia Medica*. A Handbook for the Physician and Pharmacist. 1906.

A Brief Sketch of the Life and Writings of Fabricius of Aquapendente. By J. Gurindon, M. D.

Morphology and Embryology of the Nasal Fossa of Vertebrates. By L. Dieulafe, Translated by H. V. Loeb, M. D.

A Case of Cerebellar Abscess Following Chronic Suppurative Otitis Media; Operation; Death; Autopsy. By E. B. Dench, M. D.

Report of Autopsy and pathological Findings in a Case of Cerebellar Abscess, After Radical Operation for Chronic Purulent Otitis Media. Read on invitation before the American Otolological Society. By G. S. Dixon, M. D.

## BOOK REVIEWS.

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**Prevalent Diseases of the Eye.** By Samuel Theobald, M. D., Clinical Professor of Ophthalmology and Otology, Johns Hopkins University. Octavo of 551 pages, with 219 text-illustrations, and 10 colored plates. Philadelphia and London. W. B. Saunders Company, 1906. Cloth, \$4.50 net; Half Morocco, \$5.50 net. W. B. Saunders Company. Philadelphia and London.

Of the numerous modern textbooks on ophthalmology, Theobald's *Prevalent Diseases of the Eye* is sure to rank among the most serviceable. It is well written, clear and simple in its language. The author's personal experience and opinions take a prominent part, as those of a teacher should do. This is especially pronounced in the methods of treatment of the different diseases. It is sure to succeed.

Print and illustrations leave nothing to be desired.

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**Photscopy (Skiascopy or Retinoscopy).** By Mark D. Stevenson, M. D. Illustrated. W. B. Saunders Co. Philadelphia and London, 1906. Price, \$1.25.

A very clear description of the underlying principles and the methods of using skiascopy or, as the author prefers to call it, photscopy, for the objective measurement of the refraction of the eye. The book is undoubtedly very valuable to the beginner and the student. It has a number of very good illustrations. We want to call attention to, especially the colored plate giving the appearance of the light reflex in the different forms of ametropia. A history of the method and a very complete bibliography are added.

**Retinoscopy (or Shadow Test)** in the determination at one meter distance, with the plane mirror. By James Thorington, A. M., M. D. 5th edition, revised and enlarged. 54 illustrations, 10 of which are colored. P. Blakiston's Son & Co. Philadelphia. 1907. Price, \$1.00.

This fifth edition of Thorington's *Retinoscopy* is enlarged from the former one, which this journal has had occasion to recom-

by an additional chapter on the electric retinoscope. It will undoubtedly prove as popular as its predecessors.

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Das System der Skiascopic and Ophthalmoskopie vom Standpunkt der physischen, physiologischen und geometrischen Optik. (The system of skiascopy and ophthalmoscopy from the standpoint of physical, physiological and geometrical optics.) By Dr. Hugo Wolff. 15 illustrations and 10 plates. S. Karger. Berlin. 1906. Price 12 marks.

This is a magnificent volume and the most pretentious on the subject of skiascopy in the German language which we had occasion to review. In former works the author has given his views on skiascopy and introduced his electric skiascope. In the present volume he gives a careful mathematical deduction of all the different phenomena observed and illustrates this with very clear and beautiful plates. In his examination he uses a specially made electric lamp and with it he succeeds in not only measuring the refraction to  $1/4$  D., but, also, the astigmatism to  $1^\circ$ . In his opinion the opening in the observer's mirror or rather the reflected image of this opening plays the chief role. It is impossible to describe in detail the mathematical part of the book; but to those capable of studying it in the original, it must be most highly recommended.

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Guide pratique pour le Choix des Lunettes. (Practical guide to the selection of glasses.) By Dr. A. Trousseau. 2d Edition. F. R. de Rudeval, Paris, 1907.

This little volume addresses itself to the beginner and the student. It does not pretend to be a text book, but simply wishes to offer correct and practical hints as to the selection of the correct glasses for the correction of refractive errors. This end the author has surely reached in an admirable manner.

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Rhythmotherapy, or a Discussion of the Physiologic Basis and Therapeutic Potency of Mechano-vital Vibration; to which is added a Dictionary of Diseases, with Detailed Suggestions as to the Technic of Vibratory Therapeutics, with Illustrations, by Samuel S. Wallian, A. M., M. D., Chicago, Ouellette Press, 1906. Price \$1.50.

Among the different so-called methods of treatment vibration has of late become more and more fashionable in all branches

of medicine. That it has its field of usefulness cannot be doubted. This volume on rhythmotherapy tries to give an explanation of its action in general in different diseases. It also gives a detailed description of vibrators adapted to almost any part of the body. That the author's enthusiasm will be taken up speedily by the scientific world we doubt. Nevertheless the book is well worth reading. It is not written to advertise any special make of vibrator, and contains much that may be useful aside from the remarks on vibration.

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A non-surgical treatise on the diseases of the prostate and adnexa. By George Whitefall Overall, A. B., M. D., Chicago. Rowe Publishing Co., 1906.

This treatise draws especial attention to the author's method of treating diseases of the prostate and neighborhood directly by the application of medical agents, instead of by operation. The author's own applicator, cystoscope and electrical instruments are especially dwelled upon. The results seem to be excellent. The book is very well and practically illustrated and should be read with great interest. ALT.

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#### HYPOPYON KERATITIS—ANTIPNEUMOCOCCUS SERUM.

Helbron (Berliner Klinische Wochenschrift, No. 21, 1906) reports having used the antipneumococcus serum in a number of cases of serpiginous ulcer of the cornea, it having been shown that this form of ulcer is usually caused by infection with pneumococci. The serum was used both by instillation locally and by injection. While it seemed to be of some service in the milder cases when used early, it proved to be ineffective in severe ones. After trying the different methods advised for this condition, Helbron finds that the galvanocautery at a dull-red heat is most effective. Having cleansed the eye carefully he passes the cautery over the entire surface of the ulcer, and then applies an ointment of boric acid or corrosive sublimate and bandages the eye. If there is much hypopyon he perforates the cornea near the periphery and evacuates the pus. He believes the scar following a cautery wound is much less dense than that after healing of an ordinary ulcer.